# Manual

# CO2 Leak Alert System

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# Safety

CO2 is a colourless, odourless gas that normally exists at a concentration of about 0.04% in the air we breathe. CO2 gas does not support life and in concentrations above 4% it has dangerous effects (IDLH).
The equipment that stores and uses CO2 is designed for normal safe operation when properly maintained. But leaks may cause High concentrations of CO2 creating unsafe conditions. CO2 is 1 ½ times heavier than air. It will concentrate in low areas posing a risk of asphyxiation/suffocation to anyone in or entering those areas. The quantity of gas in relation to the size of a room or space is what defines if an area is to be considered a confined area. The CO2 Alert continuously monitors CO2. It indicates

- when the TWA 8 hours (Time Weighted Average) has been passed (EU Directive and a PEL according to OSHA),
- when 1.5% of CO2 is reached (37 times higher than normal and indicates that something is not correct) : the Leak or source of the CO2 should be stopped,
- when 3% of CO2 is reached (HIGH ALARM) : The premises should be evacuated.

### CO2 Concentration Levels (%) and Effects

| CO2 % | Effect |
|---|---|
| 20.0 | Death within a few seconds |
| 10.0 | Convulsion, Unconsciousness, Death |
| 7.0 | Dizziness, Vomiting, Headache, Reduced blood supply to brain |
| 4.0 | IDLH -Immediate Danger to Life and Health |
| 3.0 | Normal exhale concentration; increased breath and pulse rates |
| 1.5 | Shortness of breath possible |
| 0.5 | Maximum for working conditions |
| 0.1-0.3 | High values in office |
| 0.04 | Fresh air |

### TWA (Time Weighted Average)

In most countries the Hygienic Limit Value over 8 hours is 0.5 % or 5000 ppm. It is not acceptable to be exposed to more than this value during an 8-hour working day. EU DIRECTIVE 2006/15/EC of 7 February 2006, OSHA PEL (Permissible Exposure Limit) as well as ACGIH.

# General Description

## Product description and Performance

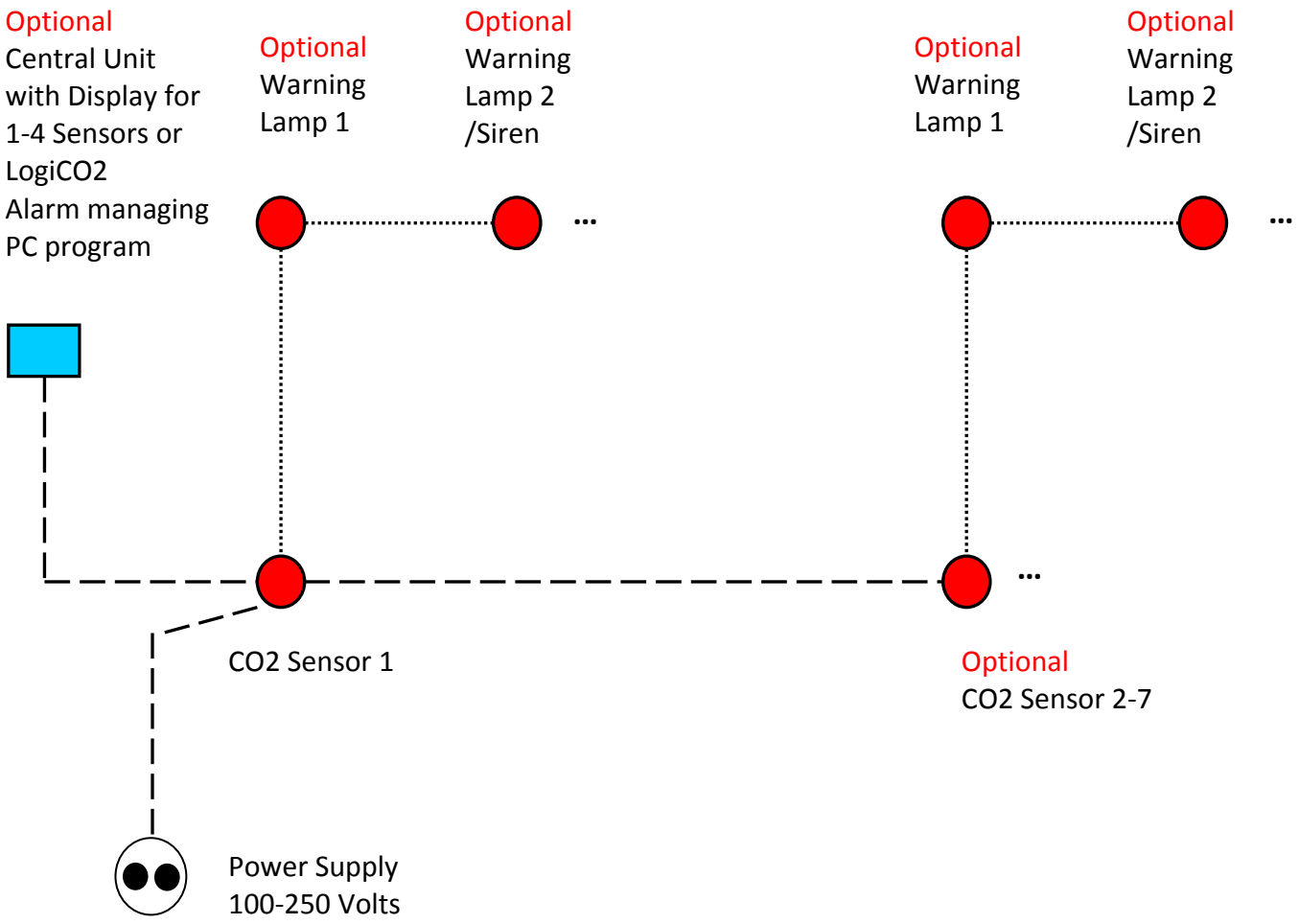
The CO2 Alert is designed to measure the CO2 concentration in the ambient air. It is a precision instrument that uses infrared analysis for detecting CO2.

It provides alarm in the event that CO2 level reaches preset alarm levels:

- If the CO2 concentration reaches a level of 1.5% (preset alarm), the sensor will emit five pulsing sounds and flashes wait one second and repeat Alert until the level is under the Alert level.
- If the CO2 concentration reaches a level of 3.0 % (high alarm), the sensor will emit countinous pulsing sound and flashes until the level is under the high alarm level.
- If the TWA for 8 hours surpasses 5000 ppm, The CO2 Alert will sound and blink one time every five seconds

The CO2 Alert can be connected to separate **optional** components:

- Additional warning lamps,
- Additional siren,
- A Central Unit
- More CO2 Alerts
- A Central Computer System/PC with LogiCO2's CO2 Alert Program using the RS485 MODBUS communication protocol



See how to manage the CO2 Alert ID on page 16

# General Description of the Central Unit (Optional)

If the optional Central Unit is connected, alarms reported by any sensor connected will be displayed on the Central Unit:

- If the CO2 Concentration level of any sensor reaches 1.5 %, the central unit will emit an intermittent audible tone, “low alarm” will be displayed and the red “alarm/alert” LED will blink.
- If the CO2 Concentration level of any sensor reaches 3.0%, the central unit will emit a continuous audible tone, “ALARM” will be displayed and the red “alarm/alert” LED will blink.
- If the TWA for 8 hours surpasses 5000 ppm, the Central Unit will display “TWA ALARM”, the red “alert/alarm” LED is blinking and beeper is sounding.
- If there is a fault in the System the Central unit will display the Fault code in the display.
- The Central Unit can also test the Systems functionality.
- The Real Time CO2 value as well as the TWA is displayed on the display.
- A buzzer sounds when there is an error or alarm/alert. Error and alerts are indicated by an intermittent sound and alarm by a continuous sounding buzzer
- Under the right bottom side of the unit there is a sound mute/reset/test button. Muting is done by quickly pressing the button, resetting is accomplished by pressing the button until the text Cleared appears on the display together with short beeps and it is possible to test the systems alarm indications with a longer press on the button.

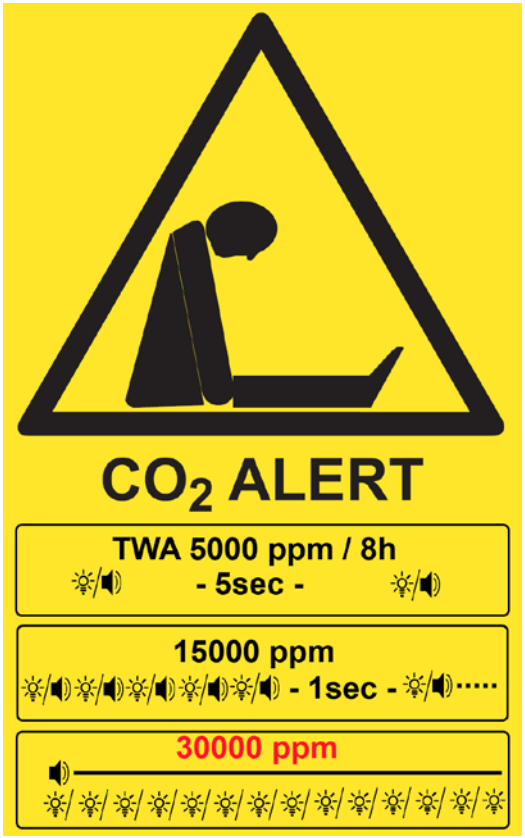
If there is a system fault, the yellow « error » LED blinks. The error code is displayed until the fault has been solved. A system reset is made by pressing the reset button until “cleared” is indicated in the display followed by two beeps.

**Error codes on the Central Unit**
**C0001** Communication error. Check for lose cable.
**C0006** Stuck reset button.
**E0032** A measured value on a sensor is out of range

## The warning signs provided with the CO2 Alert Sensor and the Central Unit.

The signs delivered with CO2 Alert, additional Warning Lamps, Additional Siren and Central Unit should be placed next to the respective units.

### Warning sign delivered with the CO2 Alert.




### Warning Sign delivered with additional Warning Lamps and Siren

## Sign delivered with Central Unit: “What to do in case of an ALARM?”

1. **Keep Calm !**
2. **Turn off the acoustic alarm on the blue Central Unit by pressing the RESET button on the bottom right side.**
3. **Check the type of alarm and which sensor is giving the alarm by following the instructions below.**

| INDICATION | CAUSE | ACTION |
|---|---|---|
| **Blue Central Unit:**<br>• The **red** diode is ON<br>• **Countinuous** acoustic signal<br>Display<br>1. **ALARM**, Sensor Number and CO2 %<br>2. This is shown each cycle. | **HIGH ALARM**<br>**!**<br>**TAKE PRECAUTIONS**<br>**High concentration of CO2 caused by a leak.** | **DO NOT ENTER the risk zone**<br>**Evacuate the restaurant**<br>Call and inform the following **tel no**: ……<br>Ensure, to the extent possible, that there is ventilation from the outside. |
| **Blue Central Unit:**<br>• The **red** diode is ON<br>• **Intermittent** acoustic signal<br>Display<br>1. **LOW-ALARM**, Sensor Number and CO2 %<br>2. This is shown each cycle. | **LOW-ALARM**<br>**High concentration of CO2 caused by a leak.** | **A service technician should enter the room in question ONLY under the supervision of another person**<br>Open the doors and the windows as much as possible.<br>Close all CO2 Containers.<br>Remedy Leakage |
| **Blue Central Unit:**<br>• The **red** diode is ON<br>• **Intermittent** acoustic signal<br>Display<br>1. **TWA-ALARM**, Sensor Number and CO2 ppm<br>2. This is shown 3 times each cycle. | **TWA-ALARM**<br>**There is a small CO2 Leak that has lasted for over 8 hours** | Open the doors and the windows as much as possible.<br>Remedy leakage<br>If the leak is not found, call service on<br>**tel no** : …….. |
| **Blue Central Unit:**<br>• The **yellow** diode is ON<br>• **Intermittent** acoustic signal<br>Display : Fault no, Sensor no and fault code. | **SYSTEM FAULT** | Check the manual |
| **C0001** : Communication Error | | ErrorCheck that the cables between the sensor and the blue Central Unit are not damaged and correctly connected |
| **E0032** : Sensor Value Out of Range | | Call Service<br>**tel no** : …… |

| | | |
|---|---|---|
| **After Alarm, always reset System.** | **ALARM RESET** | Press reset button until "**CLEARED**" is shown in the display. |
| **To insure that all warning lamps and sounders function** | **ALARM TEST** | Press reset button until "**TESTING ALARM**" is shown in the display. |

| Sensor | Place |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |

## CO2 Safety System

### What to do in case of an ALARM?

1. **Keep Calm !**
2. **Turn off the acoustic alarm on the blue Central Unit by pressing the RESET button on the bottom right side.**
3. **Check the type of alarm and which sensor is giving the alarm by following the instructions below.**

| INDICATION | CAUSE | ACTION |
|---|---|---|
| **Blue Central Unit:**<br>• The **red** diode is ON<br>• **Continuous** acoustic signal<br>Display<br>1. **ALARM**, Sensor Number and CO2 %<br>2. This is shown each cycle. | **HIGH ALARM**<br>**!**<br>**TAKE PRECAUTIONS**<br>**High concentration of CO2 caused by a leak.** | **DO NOT ENTER the risk zone**<br>**Evacuate the restaurant**<br>Call and inform the following<br>**tel no**: .....<br>Ensure, to the extent possible, that there is ventilation from the outside. |
| **Blue Central Unit:**<br>• The **red** diode is ON<br>• **Intermittent** acoustic signal<br>Display<br>1. **LOW-ALARM**, Sensor Number and CO2 %<br>2. This is shown each cycle. | **LOW-ALARM**<br>**High concentration of CO2 caused by a leak.** | **A service technician should enter the room in question ONLY under the supervision of another person**<br>Open the doors and the windows as much as possible.<br>Close all CO2 Containers.<br>Remedy Leakage |
| **Blue Central Unit:**<br>• The **red** diode is ON<br>• **Intermittent** acoustic signal<br>Display<br>1. **TWA-ALARM**, Sensor Number and CO2 ppm<br>2. This is shown 3 times each cycle. | **TWA-ALARM**<br>**There is a small CO2 Leak that has lasted for over 8 hours** | Open the doors and the windows as much as possible.<br>Remedy leakage<br>If the leak is not found, call service on<br>**tel no** : ..... |
| **Blue Central Unit:**<br>• The **yellow** diode is ON<br>• **Intermittent** acoustic signal<br>Display: Fault no, Sensor no and fault code. | **SYSTEM FAULT** | Check the manual |
| **C0001** : Communication Error | | ErrorCheck that the cables between the sensor and the blue Central Unit are not damaged and correctly connected |
| **E0032** : Sensor Value Out of Range | | Call Service<br>**tel no** : ..... |
| **After Alarm, always reset System.** | **ALARM RESET** | Press reset button until "CLEARED" is shown in the display. |
| **To insure that all warning lamps and sounders function** | **ALARM TEST** | Press reset button until "TESTING ALARM" is shown in the display. |

| Sensor | Place |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |

# Operation/Installation

The CO2 Alert is immediately operational when connected to normal 100-240 VAC power supply. Please observe that you have to connect the appropriate plug adaptor to the power supply depending on in which country you are. To become familiar with the system's operation, carefully remove its components from the box and plug the power supply into an electrical supply outlet.

# Sensor Self Test when starting the System

When starting the CO2 Alert the red LED on the side of the unit will indicate power and with a constant light proper function. The Alarm will activate for a few seconds and then go into function mode
The CO2 Alert is in normal running mode when only the red LED is on continuously.

If the Optional Central Unit is connected the red, yellow and green LED will light up. Mini C followed by the software version number is shown on the display, this is followed by the display indicating the default sensor number (1-4), and this is followed by indicating Start-up. When the Central Units start-up procedure is finished, the display will show Online and measured sensor values.

# Determine Proper Location for System Components

## CO2 Leak Detector

The CO2 Alert sensor should be placed in the room where

- CO2 equipment is being used,
- CO2 is likely to accumulate in the event of leak or other CO2 Source.

One sensor unit will monitor a room of up to approximately 100m2 / 1000 ft2 (without functioning natural ventilation or open entry way).

Place the sensor unit at a height within 12 inches/ 30cm to 24inches/ 60cm from the floor (depending on local legislation).
The sensor should be installed so it has clear exposure to room air but is away from ventilation inlets or outlets.
Try to position the unit where it will be out of the way of moving objects and where it is visible.

**NOTE**

- Please observe that this does not necessarily have to be where the CO2 is stored, for example when the CO2 is stored outside.
- **CO2 is a heavy gas and it will concentrate in low areas.**
- **If the room has only mechanical ventilation it should have a sensor.**

## Optional Warning Beacon

The optional warning beacon, if equipped, must be located where its flash is visible at any entrance to the area being monitored. This may require more than one beacon.

## Optional Warning Siren

The optional siren should be mounted on the wall above the sensor.

## Optional Central Unit

**The Optional Central Unit must be placed outside the room being monitored (risk area), preferably in a place where is easily seen by the working staff.**

## Installing the Warning Beacon

1. Separate the beacon from its mounting base using a counter clockwise twist.
2. Mount the base in a proper location using screws through the knockouts on the « back» of the base. Make sure the conductor wires pass through a cable strain relief in the base and are attached securely to the proper beacon terminals.
3. Attach the beacon to its base using a clockwise twist.
4. Tighten the nut on the cable strain relief. An additional beacon can be added, if necessary, at another entrance to the room being monitored. Simply connect it to the extra pair of terminals in the « first » beacon using two-conductor (20 or 24 AWG) cable. Route the cable through a knockout on each base using cable strain reliefs. Make sure the (+) and (-) terminal connections are consistent between beacons.

**- To ensure proper operation, the combined distance between (farthest) warning beacon, sensor unit, and central unit, should not exceed 100m.**

## Service and Maintenance

1. Service or maintenance work on the CO2 Alert System should be performed only by authorized professional service agents who are familiar with the CO2 Alert System and all pertinent safety and service procedures. Contact your representative for the name of the authorized service agent (s) in your area.
2. Since this is a Safety Product we recommend that a function check be performed on the CO2 Alert System by a qualified professional service agent at least once every year.
3. The CO2 Alert has no user serviceable parts. All service work should be performed by an authorized professional agent.
4. NOTE: Any attempt to service the equipment by unauthorized persons or to perform unauthorized modifications will void the warranty.
5. The sensor and central unit housing must NEVER be opened by unauthorized personnel.

Installation Record

*The Five-year warranty as of the date of installation is only valid when this form has been completed.*

Installing Company:

……

Name of installer:

……

The LogiCO2 Safety System has been properly installed and tested by an authorized person.
Operation instructions have been provided by:

……..

Date: ……..

Signature/Installation company:

……..

Signature/Customer:

……..

# Specifications

## CO2 Alert Sensor

| | |
|---|---|
| **Product** | Operating principle Non-dispersive infrared (NDIR<br>Measurement range - temperature 0...+40°C (+32°F...+102°F)<br>Measurement range - CO2 0-3 Vol.%<br>Extended range - CO2 3-10 Vol.%<br>Gas sampling mode Diffusion |
| **TWA** | Time Weighted Average (TWA) calculation 8 h time span (most recent) with 4 min sample period. (Pat. Pend.) |
| **Accuracy** | CO2: At full operating temp range (0...+40°C) +5% of measured value<br>Digital resolution 0.01 Vol.%<br>Pressure dependence +0.21% of reading per mm Hg in relation to calibration value or +1,6% of reading per kPa<br>Annual zero point drift <0.01 Vol.% with automatic self calibration feature |
| **Ambient temperature** | 0-40°C (+32°F...102°F) |
| **General performance** | Compliance with 89/336/EEC<br>Sensor life expectancy > 15 years<br>Operating humidity range 0 to 95% RH (non condensing)<br>Warm-up time (22°C) 1 min.<br>Overvoltage Cat II, Pollution degree II<br>- Please observe that since this is a safety product we recommend that a function control be carried out once a year |
| **Power** | Power input 12-24V DC<br>Maximum 50 Hz ripple 5V peak-peak AC sine wave (if within power input range)<br>Power consumption ≤ 0.8 Watts average of DC (external optional warning lamp not included)<br>Average current 72 mA @ 12V DC<br>Peak current 0.6A during 10 ms, 0.2A during 250 ms |
| **Outputs** | Digital interface RS485 serial port - MODBUS<br>Red blinking - Function alarm<br>Red constant - Operation<br>Transistor output 24V DC, min. 1mA |
| **Ingress protection** | IP 54 |
| **Approval** | EN 50081-1 / EN 50082-2 / CE.<br>Sensor is approved for alarm purposes by the French LNE<br>UL registered. |
| **Filter** | Insect protection according to EN 54-7:1994 |

## CO2 CENTRAL UNIT (Optional)

| | |
|---|---|
| **Supply** | 12-24V DC |

| | |
|---|---|
| **Current consumption** | 40 mA |
| **Communication** | RS485, Modbus |
| **Display** | Two row<br>2 x 8 digit |
| **Acoustic signal-strength** | 70 dB (1m) max. |
| **Ambient temperatures** | 0-40°C (+32°F...102°F) |
| **Humidity** | 0-90% non-condensing |
| **Ingress protection** | IP 20 |
| **Approval** | CE Emission tests according SS-EN 61000-6-3 and the immunity tests according to SS-EN 61000-6-2.<br>Manufactured in accordance with DIN 6653-2.<br>The CO2 Safety System is tested by the German TÜV-Rheinland.<br>Approved by UL |
| **Dimensions (LxWxD)** | 98 x 66 x 41 mm |

## WARNING LAMP (BEACON) (Optional)

| | |
|---|---|
| **Nominal voltage** | 10-60V DC +/- 1+% |
| **Average current** | 88 mA |
| **Flash energy** | 2 Joule |
| **Flash frequency** | 60/min |
| **Ambient temperature** | -10°C...70°C (14°F...158°F) |
| **Dimenstions** | Ø 91 x Height 96 mm / Ø 3.6'' x Height 3.8'' |
| **Ingress protection** | IP 54 |

## SIREN (Optional)

| | |
|---|---|
| **Nominal voltage** | 9-28V DC +/- 10% |
| **Average current** | 28 mA @ 24V DC supply |
| **Decibel** | 111 dBA / 1 m |
| **Dimensions (LxWxD)** | Ø 91 x Height 94 mm / Ø 3.6'' x Height 3.7'' |
| **Ingress protection** | IP 54 |

## PLUG-IN POWER SUPPLY

| | |
|---|---|
| **Input voltage** | 100-240V AC, 50/60 Hz, max 0.4 A |
| **Output** | 24V DC, max 0.625 A |
| **Dimensions (LxWxD)** | 78.5 x 50 x 35 mm / 3.1'' x 2'' x 1.4'' + input plug |
| **Ingress protection** | IP 30 |
| **Ambient temperatures** | 0-40°C (+32°F...102°F) |

# Warranty

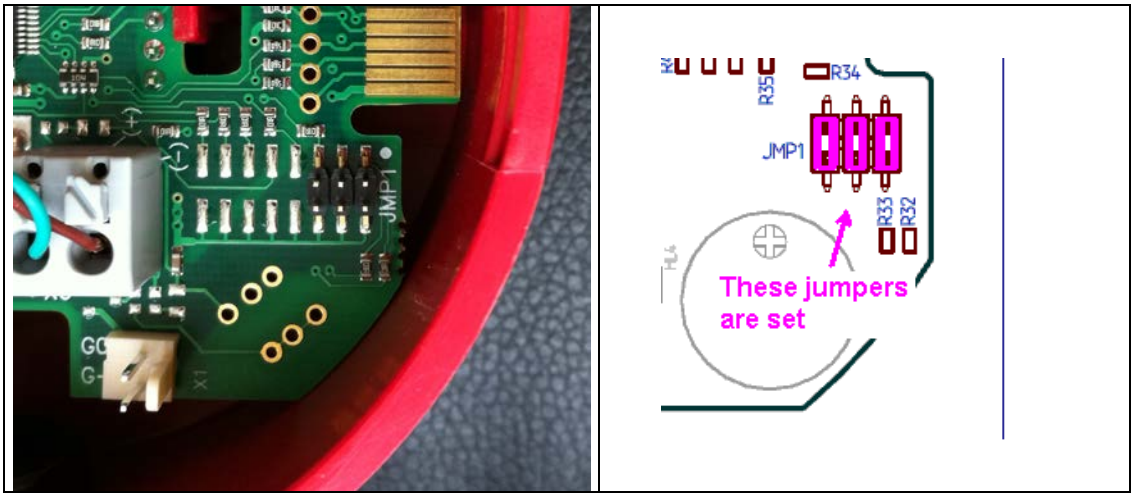
## Warranty Policy

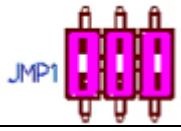
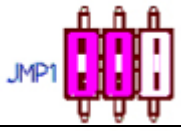
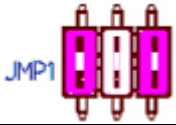
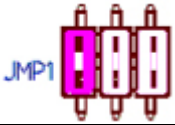
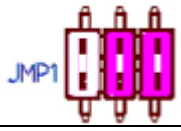
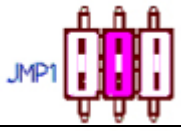
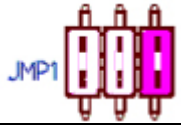
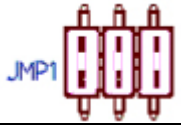
LogiCO2 warrants to the Purchaser of the CO2 Alert System equipment for 5 years from the installation date that said equipment shall be free from any defects in workmanship and materials. LogiCO2 also warrants the reliability of the calibration in the CO2 Safety System for five years from the date of the original installation. Purchaser agrees that as a pre-condition to any LogiCO2 liability hereunder, Purchaser or its appointed agents shall fully inspect all goods immediately upon delivery and shall give LogiCO2 written notice of any claim or defect within ten (10) days after discovery of such defect. As a further pre-condition to any LogiCO2 liability about hereunder, both parts replacement and labour must be supplied by an approved LogiCO2 service company. LogiCO2 may elect to repair or replace such equipment or any defective component or part thereof which proves to be defective, or to refund the purchase price paid by the original Purchaser. LogiCO2 shall not be liable for defects caused by the effects of normal wear and tear, erosion, corrosion, fire, explosion, misuse, or unauthorized modification. Alterations or repair by others than those designated and approved by LogiCO2 or operation of such equipment in a manner inconsistent with LogiCO2 accepted practices and all operating instructions, unless pre-authorized in writing by LogiCO2, shall void this Warranty. LogiCO2's sole and exclusive liability under this Warranty is to the Purchaser and shall not exceed the lesser of the cost of repair, cost of replacement, or refund of the net purchase price paid by the original Purchaser. LogiCO2 is not liable for any losses (including CO2), damages, or costs of delays, including incidental or consequential damages. LogiCO2 specifically makes no warranties or guarantees, expressed or implied, including the warranties of merchantability or fitness for a particular purpose or use, other than those warrantied expressed herein.

## Warranty Claims Procedure

All warranty claims must be previously authorized by:
LogiCO2 / electronic approval may be obtained by
contacting:
**LogiCO2 Online S.A.R.L.**
**P.B. 172**
**7502 Mersch**
**Luxembourg**
**e-mail: info@logico2.com**
Authorization must be obtained from LogiCO2 prior to shipping any equipment to LogiCO2 facilities. The customer returning the goods is responsible for all freight, proper packing, and any damage incurred during shipment of the goods back to LogiCO2.

# Jumper settings to manage CO2 Alert ID

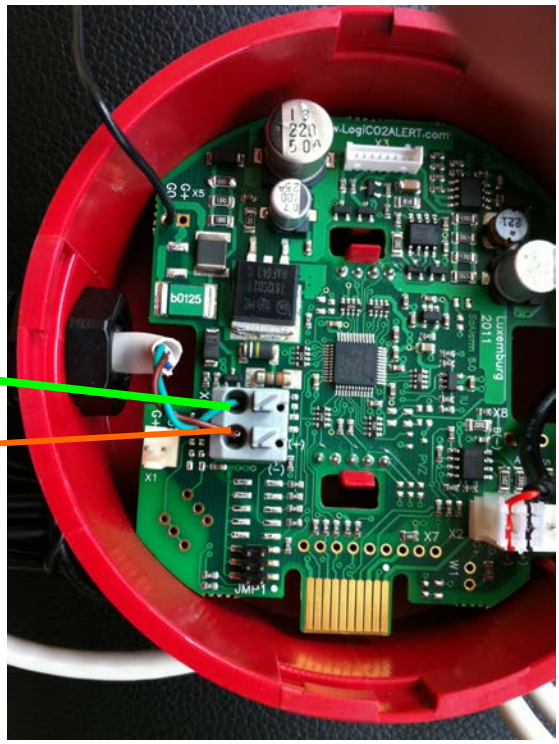



| | | | |
|---|---|---|---|
|  | Sensor ID 00 |  | Sensor ID 01 |
|  | Sensor ID 02 |  | Sensor ID 03 |
|  | Sensor ID 04 |  | Sensor ID 05 |
|  | Sensor ID 06 |  | Sensor ID 07 |

## External Warning Lamp connection

Optional warning lamp

CO2 Alert



## IMPORTANT

**All persons responsible for the use and maintenance of this equipment must read and understand the safety and operating information contained in this guide. Installation and service of this equipment should be performed only by professionals. The function of the equipment will be impaired if it is not properly installed.**